

A NEW FOSSIL PELICAN FROM OLDUVAI

By C. J. O. HARRISON & C. A. WALKER

ABSTRACT

A new species of fossil pelican, *Pelecanus aethiopicus*, based on a tarsometatarsus and a scapula (both incomplete), is described from the Middle Pleistocene of Olduvai, Tanzania. It is compared with Recent and fossil forms.

IN THE COLLECTION of the Department of Palaeontology of the British Museum (Natural History) are several fragments of bird bones collected from the Middle Pleistocene deposits at Olduvai, Tanzania. All the specimens are of birds associated with an aquatic environment, and are referable to Recent genera, but some may be sufficiently different from present-day forms to make it necessary to consider them as separate species. One such is the proximal part of a tarsometatarsus of a pelican which might have been a forerunner of one or more Recent species within the genus concerned.

Order PELECANIFORMES Sharpe

Suborder PELECANI Sharpe

Family PELECANIDAE Vigors

Genus *PELECANUS* Linnaeus

Pelecanus aethiopicus sp. nov.

Plate 7

DIAGNOSIS. Proximal end of tarsometatarsus having internal edge of anterior surface with posterior curvature and with smooth, not abrupt slope to lip of internal cotyla. On internal anterior edge, the ridge marking proximal edge of ligamental furrow curves posteriorly only a little distal to level of hypotarsus. Distal edge of posterior aperture of inner proximal foramen only just proximal to level of distal edge of hypotarsus. Hypotarsus posteriorly prominent on internal side, with sharp slope towards internal side. Internal calcaneal ridge stout, with head only slightly prominent distally, and with slight ridge towards internal edge. Triangular bridge, tapering distally, over second tendinal groove formed by heads of next two calcaneal ridges. Internally the edge of this triangular head begins only a little anterior to edge of head of internal calcaneal ridge, and slopes externally, with some anterior curvature. External tendinal groove accommodated laterally, on the external side of hypotarsus, rather than on posterior surface (Fig. 11).

MATERIAL. Holotype, proximal end of a right tarsometatarsus, British Museum (Natural History) Palaeontology Dept. No. A 4291. Paratype, proximal end of a right scapula, No. A 4292 in the same collection.

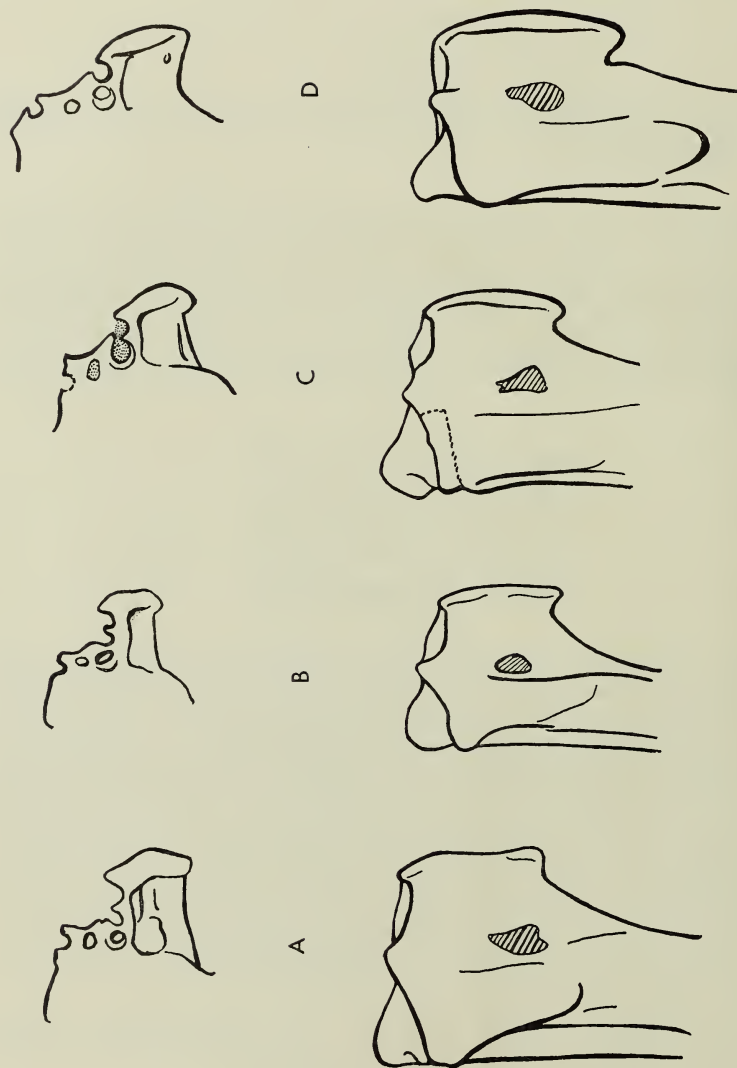


FIG. 11. Anterior and internal views of proximal end of right tarsometatarsi. A, *P. crispus*; B, *P. rufescens*; C, *P. aethiopicus* sp. nov., BM(NH) No. A 4291; D, *P. onocrotalus*.

LOCALITY AND HORIZON. Bed I, site FLKS, Olduvai Series (Middle Pleistocene), Olduvai Gorge, Tanzania (Leakey 1965 : 102). Collected and presented by the late Dr L. S. B. Leakey, 1935.

DESCRIPTION. The holotype is the proximal end of a right tarsometatarsus (Fig. 11C) in good condition, but with the tendinal canals and anterior fossa filled with matrix and some crushing of the shaft distally. The external surface is broad and flat, terminating posteriorly in a distinct ridge, and anteriorly forming a more rounded ridge bordering the anterior fossa. The anterior surface has a distinct median metatarsal groove deepening towards the occluded fossa. At the distal edge of the fossa there is a small tibialis anticus tubercle on the inner side and a smaller ancillary pit next to it on the external side.

The internal edge is more smoothly rounded than the external edge and shows some posterior curvature distally. At the proximal end it widens to accommodate a broad, short hollow just below the lip of the cotyla, presumably for the attachment of the proximal ligament ; the inner edge of this projects inwards across the proximal edge of the fossa. The more distal part of the internal edge is smoothed away where a ligamental band would have crossed it, this surface terminating proximally in a small ridge a little below the level of the tibialis anticus scar and curving posteriorly across the internal side (Fig. 11C).

The internal surface is slightly curved and narrow proximally, to widen again just below the lip of the internal cotyla, which is broken in the present specimen. The proximal surface is roughly rectangular. The intercotylar prominence is elevated and bluntly rounded. Viewed anteriorly, it shows some external deflection ; viewed laterally it shows slight anterior prominence, continuing the line of the inner edge of the proximal ligamental attachment hollow, and dorsally slopes gradually towards the hypotarsus. The internal cotyla is narrower laterally and concave with a slight anterior tilt. The external cotyla is narrow and slopes anteriorly, its anterior edge curving down towards the anterior fossa. There is a narrow slanting intercotyla depression at the posterior inner edge of the internal cotyla, and a narrow, shallow groove crosses the posterior edge of this cotyla and extends to the opening of the second tendinal canal.

The hypotarsus is large and stout. The main structure is the internal calcaneal ridge which is thick and prominent, although extending less far proximodistally than those of some *Pelecanus* species. Its posterior surface is flattened, projecting a little at the edges and sloping externally with a slight longitudinal ridge towards the internal side. Distally, below this overhanging surface the calcaneal ridge extends distally, decreasing in height. The internal surface of the ridge is irregular with small ridges and foramina. The posterior aperture of the inner proximal foramen, at the base of the inner calcaneal ridge just below the projecting surface, is large and irregular in shape. The anterior surface of the inner calcaneal ridge is concave, with a narrow projecting external edge.

On the external side of the large inner calcaneal ridge there are two tendinal canals, one above the other, only one showing between the edge of the posterior surface of the ridge and the edge of the surface roofing the next tendinal canal. The second lateral tendinal canal, between the middle and outer calcaneal ridges, is

roofed over. The middle calcaneal ridge is much shorter and slimmer than the inner, and only half as long. The roof of these forms a triangular-shaped surface, tapering distointernally and with a hollow above the tendinal canal, and has an external slant. The posterior opening of the outer proximal foramen is just distal and external to the posterior opening of the second tendinal groove. On the external side of the external calcaneal ridge there is a shallow lateral groove, a second groove diverging anteriorly from the distal end of this and passing across the proximal posterior corner of the external surface. Both these latter grooves are small and poorly defined, with a slight ridge between them which is eroded in the specimen.

The paratype is the proximal end of a right scapula with furcular articulation broken off short, at a level with the eroded coracoid articulation. The shaft shows some crushing. The coracoid articulation is a prominent rounded facet projecting beyond the line of the anterior edge. The glenoid facet, which slants proximo-internally, is oval and elongate, with a small prominent lip along its outer edge, and a concavity in the bone on the dorsal surface above it.

MEASUREMENTS (in millimetres). (a). Holotype: proximal end of a right tarsometarsus, BM(NH) No. A 4291.

Maximum length as preserved	53.9
Maximum width across cotyla	24.5
Minimum measurable width	16.2
Depth of hypotarsus	29.5
Depth at internal cotyla	15.5
External depth of distal end to central posterior ridge	19.3
Internal depth of distal end to central posterior ridge	15.6
Depth of external side at level of tibialis anticus scar	13.4
Depth of internal side at level of tibialis anticus scar	9.9
Length of cap of internal calcaneal ridge	20.7
Maximum width of cap of internal calcaneal ridge	11.2
Length of second calcaneal ridge	16.0

(b) Paratype: proximal end of a right scapula, BM(NH) No. A 4292.

Maximum length of scapula as preserved	45.1
Maximum width	26.2
Width to internal edge of coracoid articulation	24.0
Width of coracoid articulation	10.2
Maximum thickness of shaft	5.9
Width of shaft	11.3
Width of glenoid facet	8.6
Length of glenoid facet	14.0

COMPARISON AND COMMENTS. The following Recent specimens were available for examination. *Pelecanus crispus* 5, *P. rufescens* 1, *P. conspicillatus* 2, *P. onocrotalus* 8, *P. erythrorhynchus* 1, *P. occidentalis* 5. Of these, *crispus* (Fig. 11A), *rufescens* (Fig. 11B) and *conspicillatus* differ from *aethiopicus* in having on the external side of the large internal calcaneal ridge a series of three tendinal grooves of which the outer two are open, and in having a more posteriorly prominent calcaneal ridge. *P. erythrorhynchus* differs from *aethiopicus* in having the three tendinal grooves and a proximodistally long calcaneal ridge like that of *onocrotalus* but less abrupt distally. Its internal calcaneal ridge is, however, stout and only projects a short distance.

P. onocrotalus differs from *aethiopicus* in its stouter, less projecting, and proximodistally longer internal calcaneal ridge, and in its broader and less projecting hypotarsus. *P. occidentalis* is peculiar in that two discrete populations have different hypotarsi. The North and Central American population differs from *aethiopicus* in having the hypotarsus narrow and prominent, with two open tendinal canals posterior to a closed one, the more anterior of the two being partly enclosed. The southern population, *P. o. thagus* of Chile and Peru, is a larger form in which the hypotarsus is much stouter and projects less. The external edge of the internal calcaneal ridge is extended externally, projecting beyond the tendinal canals. The two open posterior canals become displaced anteriorly and the more anterior of the two is completely enclosed. The general effect is as though the hypotarsus had been compressed onto the tarsometatarsal shaft with accompanying distortion. In view of this divergence in what is otherwise a specifically constant character there may be grounds for re-examining all characters of the two forms of *occidentalis* to determine whether their earlier separation as two species may be preferable. Both forms differ from *aethiopicus* in the characters mentioned.

Hypotarsal material is available for only a few fossil pelicans. *P. gracilis* Milne-Edwards 1867, *P. intermedius* Fraas 1870 and *P. odessanus* Widhalm 1886 (listed by Lambrecht 1933 : 279) all have the narrower and more projecting hypotarsus typical of the *crispus* group ; on the last two the two open posterior tendinal grooves are apparent. The first two of these species are from the Miocene, the last from the Lower Pliocene. Of the three Pleistocene species already known *P. halieus* Wetmore 1933 from North America, described from a radius, is very small and osteologically similar to *erythrorhynchus*, the Recent North American species. *P. grandiceps* De Vis 1906 and *P. proavus* De Vis 1892 (p. 444), found in Australia and described as similar to *conspicillatus*, the only Recent species occurring in that region, were described from various bones among which the proximal ends of tarsometatarsi were not represented. Present information suggests *aethiopicus* differs from all of these.

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Dr C. J. O. HARRISON, Ph.D.
Subdepartment of Ornithology
BRITISH MUSEUM (NATURAL HISTORY)
TRING
HERTS

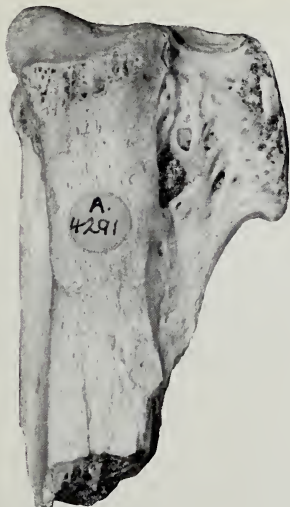
C. A. WALKER
Department of Palaeontology
BRITISH MUSEUM (NATURAL HISTORY)
CROMWELL ROAD
LONDON SW7 5BD

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PLATE 7

Pelecanus aethiopicus sp. nov.

Holotype. Views of the proximal part of a right tarsometatarsus, BM(NH) No. A 4291. A, internal ; B, anterior ; C, external ; D, posterior ; E, proximal. $\times 1\frac{1}{2}$.



A



B



C



D



E